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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology					
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	134002	174199	75729	70269	74136	79047	82780	Continuing	Continuing
A838 Neurotoxin Exposure Treatment	19261	9809	0	0	0	0	0	0	29070
A841 Minimally Invasive Surgery	11079	9809	0	0	0	0	0	0	20888
A843 Health Technology Roadmaps	1925	0	0	0	0	0	0	0	1925
A845 Bone Disease Research	2408	6404	0	0	0	0	0	0	8812
A863 Battlefield Surgical Replacement	0	2452	0	0	0	0	0	0	2452
A869 Telemedicine/Advanced Technology	3183	5213	4467	4480	3306	3499	3566	Continuing	Continuing
A870 DoD Medical Defense Against Infectious Diseases	23055	23674	24840	25611	28574	30324	32178	Continuing	Continuing
A872 Neurofibromatosis Research	11079	14714	0	0	0	0	0	0	25793
A873 HIV Exploratory Research	13813	12541	11579	11021	10890	11372	11586	Continuing	Continuing
A874 Combat Casualty Care Technology	10440	8537	8806	9063	10633	11456	12011	Continuing	Continuing
A878 Health Hazards of Military Materiel	8329	9267	10642	11369	11718	12182	12700	Continuing	Continuing
A879 Medical Factors Enhancing Soldier Effectiveness	7759	8019	8438	8725	9015	10214	10739	Continuing	Continuing
A921 Ovarian Cancer Research	0	11771	0	0	0	0	0	0	11771
A948 Portable Cardiopulmonary Bypass Pump and Oxygenator	1925	0	0	0	0	0	0	0	1925
A949 Advanced Cancer Detection	3374	0	0	0	0	0	0	0	3374
A950 Teleradiology	2890	0	0	0	0	0	0	0	2890
Page 1 of 40 Pages									
Exhibit R-2 (PE 0602787A)									

UNCLASSIFIED

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COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A951 Diagnostic and Surgical Breast Imaging	1926	0	0	0	0	0	0	0	1926
A952 Musculoskeletal Injuries	1926	5885	0	0	0	0	0	0	7811
A953 Disaster Relief and Emergency Medical Services	9630	9809	0	0	0	0	0	0	19439
A962 Polynitroxylated Hemoglobin	0	1962	0	0	0	0	0	0	1962
A963 National Medical Testbed	0	14714	0	0	0	0	0	0	14714
A964 Infomatics-based Medical Emergency Tools	0	4414	0	0	0	0	0	0	4414
A965 Eye Research	0	1962	0	0	0	0	0	0	1962
A966 Blood Research	0	5395	0	0	0	0	0	0	5395
A967 Dye Targeted Laser Fusion	0	2943	0	0	0	0	0	0	2943
A968 Synchrotron-based High Energy Radiation Beam	0	4905	0	0	0	0	0	0	4905
A977 Emerging Infectious Diseases	0	0	6957	0	0	0	0	0	6957
<p>A. <u>Mission Description and Budget Item Justification:</u> The primary goal of medical research and development is to sustain medical technology superiority to improve the protection and survivability of U.S. forces on conventional battlefields as well as in potential areas of low intensity conflict and military operations short of war. This program element funds applied research in Department of Defense (DOD) medical protection against naturally occurring diseases of military importance and combat dentistry, as well as applied research for Department of Army care of combat casualties, health hazard assessment of military materiel, and medical factors enhancing soldier effectiveness. This program element is the core DOD technology base to develop methods and materials for infectious disease prevention and treatment including vaccines, prophylactic and therapeutic drugs, insect repellents, and methods of diagnosis and identification of naturally occurring infectious diseases; prevention and treatment of combat maxillofacial (face and neck) injuries, and essential dental treatment on the battlefield; combat casualty care of trauma and burns due to weapons, organ system survival, shock resulting from blood loss and infection, blood preservation, and potential blood substitutes for battlefield care; assessment of the health hazards of military materiel, and the sustainment or enhancement of soldier performance. The work in this PE is consistent with the Army Science and Technology Master Plan, Army force modernization plans, and Project Reliance. This program is managed primarily by the U.S. Army Medical Research and Materiel Command.</p>									
Page 2 of 40 Pages					Exhibit R-2 (PE 0602787A)				

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

DATE
February 2000BUDGET ACTIVITY
2 - Applied ResearchPE NUMBER AND TITLE
0602787A Medical Technology

B. Program Change Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 2000/2001</u> PB)	138264	70136	68014
Appropriated Value	139255	176636	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-991		
b. SBIR / STTR	-3209		
c. Omnibus or Other Above Threshold Reductions		-652	
d. Below Threshold Reprogramming	-501		
e. Rescissions	-552	-1785	
Adjustments to Budget Years Since <u>FY 2001/2001</u> PB			+7715
Current Budget Submit (<u>FY 2001</u> PB)	134022	174199	75729

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A838	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A838 Neurotoxin Exposure Treatment	19261	9809	0	0	0	0	0	0	29070
<p>Mission Description and Justification: By Congressional direction, the purpose of this project is to conduct a research program on pathophysiology and treatment of neurodegenerative diseases, including Parkinson's Disease, including environmental and stress-exposure factors encountered in military operations that may be neurotoxic or lead to neurodegenerative diseases. An improved understanding of the pathophysiology of neurodegenerative diseases will form the basis of potential preventive measures against the effects of military threat agents and military operational hazards, and also lead to treatment interventions for Parkinson's Disease.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 19261 - Completed identification of research areas most relevant to neurodegenerative risk, including acquired Parkinsonism, and initiated studies to clarify etiologies, pathologies, and therapeutic strategies (metabolic interventions, neuroprotectants, and restorative therapies) most likely to yield tangible results. <p>Total 19261</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 9545 Expand and continue the program in these six thrust areas: <ul style="list-style-type: none"> - Conduct a strong basic research program to understand the fundamental nature of neural cell death and dysfunction underlying neurodegenerative diseases. - Identify protective agents that may be useful in neural cell dysfunction. - Develop improved methods for early detection of neurodegenerative disease. - Explore feasibility of new therapeutic strategies for neurodegenerative disease involving transplantation and neuroprotection. - Explore feasibility of new therapeutic strategies for neurodegenerative disease involving gene replication and other novel methods. - Investigate environmental factors that may be associated with neurodegenerative diseases. • 264 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 9809</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between;"> Project A838 Page 4 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A841	
COST <i>(In Thousands)</i>	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A841 Minimally Invasive Surgery	11079	9809	0	0	0	0	0	0	20888
<p><u>Mission Description and Justification:</u> By Congressional direction, this program supports continuation of development of sophisticated computer-based surgery devices. This program will improve technologies developed under the Computer Assisted Minimally Invasive Surgery (CAMIS) program, including integration of an intraoperative ultrasound imaging device, a small fiber endoscope, and application of an intraoperative magnetic resonance imaging device.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 11079 - Developed minimally invasive surgical technologies at the Center for Minimally Invasive Technology (CMIT) at Massachusetts General Hospital. <p>Total 11079</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 9545 - Continue development of minimally invasive surgical technologies at CMIT at Massachusetts General Hospital. • 264 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 9809</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A841 Page 5 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A843	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A843 Health Technology Roadmaps	1925	0	0	0	0	0	0	0	1925
<p><u>Mission Description and Justification:</u> By Congressional direction, this program funds the creation of technology roadmaps (e.g., plans for technologies and policies) that will facilitate efficient (advanced medical) technology development, transfer, and science-technology conversion.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 1925 - Completed, at the Department of Energy Sandia National laboratories, plans for technologies and policies that maximize the value of various outputs of advanced technology research and development programs. - Developed a methodology for determining medical applications for which technology can drive down Department of Defense (DOD) medical infrastructure costs. - Demonstrated cost reduction potential and information security aspects of telemedicine applications and efforts by the DOD. <p>Total 1925</p> <p>FY 2000 Planned Program: Project not funded in FY 2000.</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A843 Page 6 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A845	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A845 Bone Disease Research	2408	6404	0	0	0	0	0	0	8812
<p>Mission Description and Justification: This program is intended to advance bone physiology research that may lead to strategies to improve bone health of young men and women, thereby enhancing military readiness by reducing the incidence of stress fracture during physically intensive training, and reducing the incidence of osteoporosis later in life. Individual health habits that can be encouraged in young recruits may have significant effects on achievement of peak bone mineral accretion and affect other aspects of short- and long-term bone health. Understanding bone remodeling processes triggered by physical training and the relationship to injury susceptibility will reveal appropriate training and other interventions that can reduce bone injuries in military personnel. Identification of predictors of stress fracture susceptibility, efficacious interventions, and treatment strategies for susceptible and injured service members can further reduce the impact of stress fractures on readiness. The ultimate benefits of this program include establishing optimal approaches to bone health of importance to all young Americans, reduction in lost duty time from skeletal injuries, and significant medical cost avoidance for the Department of Defense and the Department of Veterans Affairs. This program fills a specific and previously neglected niche in bone physiology research, supporting a wide range of basic science through applied clinical studies on biomechanical stress on the skeleton. This is also likely to leverage related areas of importance to the military such as muscle remodeling and it supports researchers who can address other questions fundamental to bone physiology and the understanding of bone diseases; research into the pathogenesis of bone diseases substantially supports understanding of normal processes.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 2408 - Determined initial populations at risk for increased bone injuries impacting military readiness. <li style="padding-left: 20px;">- Conducted studies to clarify individual risk factors for stress fractures, restorative interventions (nutritional, training, and medical treatment) and for predictive biomarkers for field assessment of metabolic status and impending injury. <li style="padding-left: 20px;">- Laid foundation for longitudinal study of military risk factors for bone injury and body composition changes. <p>Total 2408</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 6231 Expand and continue the program in these six thrust areas: <ul style="list-style-type: none"> - Conduct a strong basic research program to understand the fundamental nature of mechanical influences on bone cells. - Develop methodology to overcome technological barriers in imaging that will enable sequential studies of functional changes in bone. - Define the role of bone remodeling in stress fracture pathogenesis to determine if it would be beneficial or harmful to block remodeling in recruit training. - Investigate interventions (e.g., calcium-nutrient drinks, weak androgens, oral contraceptives) to improve bone health in men and/or women. - Describe changes in bone density and health in longitudinal studies of young men and women engaged in demanding training program. - Investigate treatments that increase rates of healing after stress fracture. • 173 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 6404</p>									
Project A845		Page 7 of 40 Pages				Exhibit R-2A (PE 0602787A)			

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BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602787A Medical Technology	PROJECT A845
<p>FY 2001 Planned Program: Project not funded in FY 2001.</p>		
<p>Project A845</p>		

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A863	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A863 Battlefield Surgical Replacement	0	2452	0	0	0	0	0	0	2452
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this program is to establish a process to select medical research projects of clear scientific merit and direct relevance to military health including tissue regeneration for combat casualty care.</p> <p>FY 1999 Accomplishments: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2386 - Awaiting proposal submission for evaluation to be followed by contract award. • 66 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 2452</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A863 Page 9 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A869	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A869 Telemedicine/Advanced Technology	3183	5213	4467	4480	3306	3499	3566	Continuing	Continuing
<p>Mission Description and Justification: Applied research contributing to casualty avoidance, casualty detection, and evacuation and treatment of casualties through application of physiological status monitoring technologies (biophysical and biochemical sensors and fusion). Research will focus on developing a wearable, integrated system to determine soldier physiological status. This will include developing the ability to quickly and accurately determine when a soldier is minimally impaired but still capable of functioning. By extension, work will also focus on identification and initial development of parallel and supporting technologies and systems, including telecommunications networks, teleconsultation technologies, and telerobotics.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 940 - Began to modify the Land Warrior System to allow wound detection and remote triage communication between individual soldiers and the medic. - Evaluated a miniaturized eye oximeter to assess cerebral blood oxygen content for measures of brain perfusion. Explored use of a miniaturized microimpulse radar unit to assess cardiovascular function. • 864 - Supported Joint Medical Operations-Telemedicine Advanced Concept Technology Demonstration. • 1379 - Evaluated a prototype wearable Warfighter Physiological Status Monitoring (WPSM) system for use at the Dismounted Battlespace Battle Lab that has a wireless sensor network (activity, core and skin temperature, geolocation) that collects and stores information in an open, standardized format. Committed funding for basic technology development of a flexible ureteroscopic simulator with various anatomical variations, e.g., normal, benign, cancer, etc. for Endoscopic Simulator Development, Minimally Invasive Surgical Research. <p>Total 3183</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 928 - Investigate an advanced pulse oximetry signal analysis capability as a component of a real-time soldier monitoring system. Begin evaluation of a noninvasive physiologic monitoring system for use by medics in the battlefield. Continue exploration of a microimpulse radar unit for noninvasive cardiac output monitoring. • 1166 - Evaluate acoustic methods to diagnose tension pneumothoraces on the battlefield. Test a first-generation eye oximeter to non-invasively measure blood oxygen saturation and organ perfusion. Begin investigation into a noninvasive intracranial pressure monitor to assess intracranial pressure in closed head trauma. • 2239 - Test first-generation WPSM for physiological monitoring of soldier status. Interface WPSM system with Land Warrior Dead Reckoning Module to collect mission-specific physiological data from soldiers during field testing. • 740 - Support Joint Medical Operations-Telemedicine Advanced Concept Technology Demonstration. • 140 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 5213</p>									
Project A869			Page 10 of 40 Pages			Exhibit R-2A (PE 0602787A)			

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602787A Medical Technology	PROJECT A869
<p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 2036 - Continue testing noninvasive sensors for Warrior Medic to assist in far-forward remote triage. Continue evaluating Warrior Medic and WPSM electronics. Continue testing intelligent instructional systems to facilitate adaptive learning. • 927 - Utilize WPSM database, and data acquisition and management capabilities, to support the formulation and testing of modeling strategies to predict individual warfighter status. • 1504 - Explore and test a variety of medical technology overlays to tactical computing/communicating capability in order to assess performance without injury and to compare data post-injury to pre-injury. Test artificial intelligence/sensor fusion protocols for WPSM. <p>Total 4467</p>		
<p>Project A869</p> <p>Page 11 of 40 Pages</p> <p>Exhibit R-2A (PE 0602787A)</p>		

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A870	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A870 DoD Medical Defense Against Infectious Diseases	23055	23674	24840	25611	28574	30324	32178	Continuing	Continuing
<p><u>Mission Description and Justification:</u> This project supports development of medical countermeasures to naturally occurring infectious diseases, a significant threat to forces deployed outside the United States. These countermeasures will protect the force from infection and sustain operations by preventing hospitalizations and evacuations from the theater of operations.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 2934 Conducted applied research on vaccines to prevent hepatitis E and to prevent meningitis caused by Group B meningococcus, on a diagnostic device for scrub typhus, on a natural insecticide, and on control of insect vectors of disease. <ul style="list-style-type: none"> - Conducted epidemiological studies of hepatitis E at multiple sites around the world to help assess risk to deployed military forces. - Conducted the first human evaluation of a vaccine to prevent hepatitis E. - Evaluated a rapid test to detect scrub typhus infection. - Conducted animal studies to compare two vaccine candidates for prevention of Group B meningococcal infection needed for further down-selection prior to human clinical studies. - Characterized a candidate insecticide that incorporates a chemical naturally produced by bacteria that is toxic to insects. - Characterized insect populations and bite rates at field sites for vaccine and drug studies. • 2201 Conducted applied research on vaccines to prevent the most common causes of bacterial diarrhea. <ul style="list-style-type: none"> - Modified <i>Shigella</i> vaccine candidate antigens to try to improve their safety. - Evaluated the efficacy of combined <i>Shigella flexneri</i> 2a and <i>Shigella sonnei</i> vaccine in an animal model and demonstrated feasibility of protection from diverse <i>Shigella</i> types using a combination vaccine. - Studied proteins involved in the ability of <i>Campylobacter</i> to produce diarrheal disease, providing a systematic rationale for vaccine development. - Conducted studies to define which toxins and other bacterial factors are associated with disease caused by enterotoxigenic <i>Escherichia coli</i> (ETEC), important for design of vaccine candidates. - Established laboratory assays to measure intestinal immune response to candidate ETEC vaccines. - Identified four new colonization factors that may be important for ultimate development of a protective ETEC vaccine. - Cloned and expressed a colonization factor, CS3, for use in an ETEC vaccine based on multiple colonization factors. - Completed preclinical studies of CS6 (a candidate ETEC vaccine) necessary for an Investigational New Drug (IND) application to the Food and Drug Administration and ultimate clinical testing. • 2840 Conducted applied research on vaccines to prevent viral diseases capable of interrupting combat operations. <ul style="list-style-type: none"> - Evaluated the effect of adding compounds to candidate dengue vaccines that target immune cells, necessary for designing optimal vaccine systems for stimulation of a protective immune response in recipients. 									
Project A870		Page 12 of 40 Pages				Exhibit R-2A (PE 0602787A)			

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602787A Medical Technology	PROJECT A870
<p>FY 1999 Accomplishments: (continued)</p> <ul style="list-style-type: none"> - Made and characterized two candidate DNA vaccines for two of the four serotypes of dengue. - Demonstrated the efficacy of candidate vaccines against hantaviruses in an animal model. - In animal models, demonstrated the safety and the capability to produce an immune response of candidate vaccines against Lassa Fever, Crimean-Congo Hemorrhagic Fever and tickborne encephalitis viruses. • 4025 Conducted applied research on candidate vaccines for prevention of malaria and on antimalarial drugs to prevent or treat malaria. <ul style="list-style-type: none"> - Conducted immunological studies to identify components of the malaria parasite to be used in engineered vaccines, either protein or DNA. - Used a common bacteria to produce three malaria proteins to use in evaluating the immune response to naturally occurring malaria infections or to use in vaccines to protect against malaria. - Studied novel routes of immunization with malaria protein and DNA vaccines to determine the impact of immunization route on immune response in the recipient. - Developed improved methods for immunization with DNA-based vaccines, important for eliciting a more effective immune response in recipients. - Established and validated a rhesus monkey model for malaria for assessing vaccine strategies for malaria. - Demonstrated that synthetic compounds of nucleic acids (oligodeoxynucleotides or ODNs) of specific composition are potent inducers of nonspecific immunity and excellent additives for enhancing the immunizing effects of protein-based vaccines. - Expressed and purified recombinant proteins for five different target proteins for structure-based drug design of novel antimalarial drugs, a necessary step in the rational design of new candidate drugs. - Expanded existing capabilities to screen antimalarial drugs by developing new animal models. Analyzed the antimalarial activity of novel candidate compounds. - Developed tests to monitor the development and spread of drug-resistant malaria, important for guiding new drug development and the use of currently available drugs. • 11055 - Paid administrative overhead costs at the Walter Reed Army Institute of Research (WRAIR). <p>Total 23055</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 4051 Conduct applied research on candidate vaccines for prevention of malaria and on antimalarial drugs to prevent or treat malaria. <ul style="list-style-type: none"> - Develop standardized methods to reliably measure immune responses to candidate malaria vaccines. - Conduct preclinical studies of candidate vaccines to support an IND application. - Develop a method to perform human experiments where the <i>Plasmodium vivax</i> parasite can be introduced into human volunteers to test the ability of candidate vaccines to prevent disease caused by <i>Plasmodium vivax</i>, the second-most important cause of malaria. - Synthesize candidate antimalarial drugs or isolate candidate drugs from natural products. - Develop techniques for the cultivation and drug sensitivity testing of vivax malaria. - Express target proteins for structure-based drug design and determine modes of action and resistance of parasites to antimalarial drugs. - Create a deployable field test to assay drug sensitivity patterns in malaria for use in monitoring parasite development of drug resistance. 		
Project A870	Page 13 of 40 Pages	Exhibit R-2A (PE 0602787A)

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
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<p>FY 2000 Planned Program: (continued)</p> <ul style="list-style-type: none"> - Conduct screening to measure activity or cytotoxicity of candidate drugs. - Prepare radiolabelled drug candidates for preclinical studies of drug distribution, pharmacokinetics, and metabolism. - Perform preclinical toxicology studies of new drugs. • 2254 Conduct applied research on vaccines to prevent the most common causes of bacterial diarrhea. <ul style="list-style-type: none"> - Modify candidate live <i>Shigella</i> vaccines to reduce vaccine-induced toxicity and/or fecal excretion vaccine organisms while retaining efficacy in prevention of diarrhea. - Improve candidate live vaccines so that orally administered vaccine organisms can be rapidly identified if they are excreted. - Devise polyvalent vaccines so that service members can be protected against the many different types of <i>Shigella</i> bacteria that could cause diarrhea. - Characterize ETEC virulence factors to find new potential vaccine components. - Devise methods to boost mucosal immune responses to oral vaccines. - Develop an improved animal model for ETEC infection to enable testing of vaccine candidates and prediction of efficacy in animals. - Improve methods to diagnose ETEC infections, which are needed for testing efficacy of the candidate vaccines in humans. - Explore new and/or improved animal models of <i>Campylobacter</i> enteritis and immunity, including the ferret, the pig, and nonhuman primates. - Improve methods to diagnose <i>Campylobacter</i> infections, which are needed for testing efficacy of candidate vaccines in humans. • 3045 Conduct applied research on the components of diagnostic tests to be applied to a common diagnostic device for biological defense and infectious disease threats; on vaccines to prevent hepatitis E, scrub typhus, and meningitis caused by Group B meningococcus; and on control of insect vectors of disease. <ul style="list-style-type: none"> - Develop infectious disease-specific reagents for malaria, enteric diseases, dengue viruses, and the hemorrhagic fever viruses so they are compatible for use on the portable Common Diagnostic Platform for Biological Defense and Endemic Infectious Diseases capable of detecting and identifying nucleic acids. - Establish the magnitude of the immune response to hepatitis E virus (HEV) antibody that is necessary to prevent disease. - Further characterize the human immune responses to HEV infection, disease, and vaccine. - Refine epidemiology of HEV in Asia and Africa. - Sustain or refute presence of hepatitis E disease among humans in Latin America. - Characterize the animal host (particularly rodents) of HEV and the HEV isolates obtained. - Determine the feasibility of vaccine development against scrub typhus. - Optimize Group B meningitis candidate vaccine strains. - Complete animal immunogenicity and safety studies to determine the optimal presentation and formulation of Group B meningitis vaccine. - Conduct a detailed analysis of the animal and human immune responses to the Group B meningitis candidate vaccines to determine the best antigens. - Establish a standard insecticide resistance and susceptibility test and test insects capable of transmitting disease to determine if the military insecticides are still effective. - Evaluate the threat of tick- and chigger-borne diseases to the U.S. military. <p>FY 2000 Planned Program: (continued)</p>		
Project A870	Page 14 of 40 Pages	Exhibit R-2A (PE 0602787A)

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 2 - Applied Research		PE NUMBER AND TITLE 0602787A Medical Technology PROJECT A870
<ul style="list-style-type: none"> • 2844 • 11056 • 424 Total 23674 	<ul style="list-style-type: none"> - Begin development and evaluation of a dengue mosquito vector control system consisting of integrated tools and information that can be physically packaged for a preventive medicine detachment (or service equivalent). - Conduct preliminary development of devices and techniques that may serve as components of a vector control system for mosquitoes that transmit malaria, including a field device for detecting <i>Plasmodium</i> in mosquitoes. - Conduct applied research on vaccines to prevent viral diseases capable of interrupting combat operations. - Test candidate dengue vaccines to determine if they will be effective in protecting recipients of diverse genetic backgrounds. - Validate measures of immune T cell memory and assess the relevance of these immune cells to protection against dengue disease. - Validate a method for quantifying antibodies that exacerbate dengue disease. - Characterize determinants leading to severe dengue disease. - Determine the feasibility of second-generation live dengue vaccines. - Characterize mechanisms of viral hemorrhagic fever (VHF) and encephalitis pathogenesis. - Develop candidate VHF and encephalitis vaccines and test in animal models. - Evaluate antiviral drug candidates for efficacy in vitro and in animal models. - Develop and evaluate primate monoclonal antibodies for passive protective efficacy in animal models including primates. - Improve capability to rapidly identify VHF and encephalitis agents in the field and to provide definitive confirmation in reference labs. - Develop candidate vaccines against one or more hantaviruses and test in animals to assess immune responses and protection. - Improve capability to rapidly identify, assess risk, and formulate control strategies for hantaviruses to include evaluating therapeutic agents (e.g., human monoclonal antibodies or antiviral drugs) and testing them in cell culture and animals and also isolating and characterizing novel hantaviruses. - Pay administrative overhead costs at WRAIR. - Small Business Innovative Research/Small Business Technology Transfer Research Programs. 	
FY 2001 Planned Program:		
<ul style="list-style-type: none"> • 5579 • 2409 	<ul style="list-style-type: none"> - Conduct applied research on candidate vaccines for prevention of malaria and on antimalarial drugs to prevent or treat malaria. - Conduct preclinical studies of DNA vaccines to prevent <i>P. falciparum</i> malaria. - Express proteins encoded by the <i>Plasmodium vivax</i> gene homologs of the <i>P. falciparum</i> candidate vaccine components and test their ability to induce an immune response in an animal model. - Develop field sites for <i>P. vivax</i> human vaccine trials. - Develop a field site for testing a drug for treatment of multidrug-resistant malaria. - Determine a strategy to render the <i>P. falciparum</i> multidrug-resistant gene ineffective. - Conduct applied research on vaccines to prevent the most common causes of bacterial diarrhea. - Complete animal trials of candidate <i>S. dysenteriae</i> vaccines. 	
FY 2001 Planned Program: (continued)		
<ul style="list-style-type: none"> - Characterize enteric bacterial proteins identified through genomic sequence data analysis to assess their possible application to vaccine development. 		
Project A870	Page 15 of 40 Pages	Exhibit R-2A (PE 0602787A)

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ARMY RDT&E COST ANALYSIS (R-3)		DATE
BUDGET ACTIVITY 2 - Applied Research		February 2000
PE NUMBER AND TITLE 0602787A Medical Technology		PROJECT A870
<ul style="list-style-type: none"> <ul style="list-style-type: none"> - Construct candidate polyvalent <i>Shigella</i> vaccines and screen in an animal model. - Characterize the optimal formulation of the ETEC components of the combined enteric vaccine. - Prepare field sites for the evaluation of the candidate ETEC vaccine. - Characterize the immune responses associated with recovery from <i>Campylobacter</i> infection and subsequent protection from this organism. 3066 Conduct applied research on the components of diagnostic tests to be applied to a common diagnostic device for biological defense and infectious disease threats; on vaccines to prevent hepatitis E, scrub typhus, and meningitis caused by Group B meningococcus; and on control of insect vectors of disease. <ul style="list-style-type: none"> - Transition components of the DNA tests for malaria and dengue to functional use on the common diagnostic platform for biodefense and infectious disease threats. - Assess the threat of hepatitis E to U.S. service members in Africa and Latin America. - Demonstrate the feasibility of immunologic protection against scrub typhus in an animal model and demonstrate efficacy of a candidate scrub typhus vaccine in an animal model. - Genetically alter the Group B meningococcal candidate vaccine strain to enhance the ability to produce it in a vaccine manufacturing process. - Develop a rapid immunological method for detecting Leishmania-infected sand flies. - Test a synthetic replacement for the insect repellent DEET. 2730 Conduct applied research on vaccines to prevent viral diseases capable of interrupting combat operations. <ul style="list-style-type: none"> - Assess the threat of hemorrhagic fever and other highly lethal viruses on military operations. - Define strategies for countering the threat of hemorrhagic fever viruses and other highly lethal viruses. - Develop a cytotoxic T cell technology to evaluate dengue vaccine candidates. - Design generic hemorrhagic fever intervention strategies to interrupt vascular endothelial cell infection and ultimate hemorrhage. - Transition to advanced development a multivalent Hantavirus vaccine to prevent infection with viruses causing hemorrhagic fever with renal syndrome in immunized personnel. 11056 - Pay administrative overhead costs at WRAIR. 	<ul style="list-style-type: none"> Total 24840 	
Project A870		

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A872	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A872 Neurofibromatosis Research	11079	14714	0	0	0	0	0	0	25793
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this appropriation is only for neurofibromatosis research.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 11079 - Received 21 proposals in October 1998 for the FY 1998 program. - Completed peer and programmatic review by April 1999. Awarded nine grants. Received 2-year funds in January 1999 for the FY 1999 program. - Held vision setting meeting in April 1999. Published a program announcement in June 1999 and received 48 proposals in September 1999. <p>Total 11079</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 14318 - Complete peer and programmatic review by January 2000 and negotiate awards by September 2000 for the FY 1999 program. Receive funds in January 2000, hold vision setting meeting in January 2000, and publish a program announcement in February 2000 for the FY 2000 program. Receive proposals in May 2000 and conduct peer review in August 2000. • 396 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 14714</p> <p>FY 2001 Planned Program: Project not funded in FY 2001. Programmatically review and award proposals from the FY 2000 program.</p>									
<div style="display: flex; justify-content: space-between;"> Project A872 Page 17 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A873	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A873 HIV Exploratory Research	13813	12541	11579	11021	10890	11372	11586	Continuing	Continuing

Mission Description and Justification: This project provides for applied research of improved diagnostics, epidemiology, candidate immunogens, promising drugs and behavioral modification for prevention and treatment of human immunodeficiency virus (HIV). Main efforts include developing experimental models of disease, preparation of new vaccine candidates, improved diagnosis of disease, and risk assessment. Current policy prohibits antibody-positive service members from deployment outside the continental United States. A safe and effective vaccine for prevention of infection and intervention techniques will permit all service members to become worldwide deployable.

FY 1999 Accomplishments:

- 12033 Conducted applied research on novel candidate vaccines to prevent HIV infection, on the human immune response factors that predict protection from HIV infection or disease, on human cohorts for potential testing of HIV vaccines, and on animal models for testing candidate vaccines.
 - Conducted preclinical studies of clade B oligomeric protein vaccine candidates, necessary for advancement to clinical testing.
 - Established domestic and Thai laboratory infrastructure for support of vaccine efficacy trials, important for developing and standardizing measures of vaccine performance in future clinical studies of vaccine candidates.
 - Successfully established a rhesus macaque challenge model for human HIV infection using a simian-human immunodeficiency virus chimeric virus; the model is useful for assessing immunogenicity and protective efficacy of candidate HIV envelope-based vaccines.
 - Constructed and tested a DNA vaccine and demonstrated induction of antibody that is both quantitatively and qualitatively superior to recombinant protein vaccines used alone. The findings are promising and may lead to future vaccines that induce protective responses in recipients.
 - Conducted a vaccine study in baboons that suggests cross-protection of subtype B HIV infection using a single subtype E rgp120 vaccine, important for design of vaccines capable of protecting against multiple subtypes of HIV.
 - Studied viral correlates of HIV transmission and pathogenesis, important for design of vaccines and for selection of measures to be used in clinical studies to characterize and assess vaccine effectiveness.
 - Characterized HIV-specific protective epitopes of vaccine products for national and international use, important for selection and production of candidate vaccine components.
- 1780 - Paid administrative overhead costs at the Walter Reed Army Institute of Research (WRAIR).

Total 13813

FY 2000 Planned Program:

- 10432 Conduct applied research on novel candidate vaccines to prevent HIV infection, on the human immune response factors that predict protection from HIV infection or disease, on human cohorts for potential testing of HIV vaccines, and on animal models for testing candidate vaccines.
 - Evaluate the importance of HIV genotypes in predicting HIV immunotypes necessary for inclusion in an HIV vaccine.

Project A873 Page 18 of 40 Pages Exhibit R-2A (PE 0602787A)

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602787A Medical Technology	PROJECT A873
<p>FY 2000 Planned Program: (continued)</p> <ul style="list-style-type: none"> - Define the correlates of immunity to HIV, necessary for vaccine design. - Establish genetic and phenotypic correlates of drug resistance among HIV-1 clinical isolates, necessary for establishing drug treatment strategies for military dependents. - Conduct animal studies of candidate HIV vaccines to prevent HIV infection. - Evaluate and validate a rapid test for field diagnosis of HIV infection. <ul style="list-style-type: none"> • 1780 - Paid administrative overhead costs at WRAIR. • 329 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 12541</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 9859 Conduct applied research on novel candidate vaccines to prevent HIV infection, on the human immune response factors that predict protection from HIV infection or disease, on human cohorts for potential testing of HIV vaccines, and on animal models for testing candidate vaccines. - Clinically validate novel diagnostic and prognostic measurements of HIV-1 virological markers, necessary for establishing and standardizing measures of vaccine effectiveness for clinical efficacy studies. - Conduct preclinical studies of novel vaccine candidates. • 1720 - Pay administrative overhead costs at WRAIR. <p>Total 11579</p>		
Project A873	Page 19 of 40 Pages	Exhibit R-2A (PE 0602787A)

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A874	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A874 Combat Casualty Care Technology	10440	8537	8806	9063	10633	11456	12011	Continuing	Continuing
<p>Mission Description and Justification: This project funds the core technology base to develop concepts, techniques and material for the treatment and return-to-duty of soldiers wounded in combat and to support low-intensity combat as well as military operations other than war. This project addresses investigation of the treatments for weapons-induced trauma and burns, and shock due to blood loss. It also funds technologies for resuscitation fluid and blood preservation.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 1000 - Awarded contract to study pain management to Guthrie Research Institute for research into sodium channel proteins as potential pain modulators. • 2250 - Formulated a storage solution that will support refrigerated storage of red blood cells for 10 weeks. Transitioned fibrin bandage/hemostatic dressing to Milestone 0. Tested foam-based hemostatic agents in preclinical animal models. Developed and tested animal models for evaluating the life span and functionality of platelets after liquid storage for 5 days. Assessed the effects of hemolyzed red blood cells on nitric oxide production by leukocytes and survival in hemorrhage and reinfusion. • 1916 - Established reverse transcriptase/polymerase chain reaction assay for the quantification of tissue cytokine mRNA synthesis after hemorrhagic shock. Established human bronchial/tracheal and small airway epithelial cell model and determined that the toxicity of smoke is unrelated to carbon monoxide poisoning. Investigated the effects of heme proteins on nitric oxide levels and cell viability in polymorphonuclear leukocytes. Studied the apoptotic response of skin epithelial cells to burns and identified apoptotic markers and kinetics. Continued development of a miniature version of the Combat Support Trauma and Transport (CSTAT) – the miniSTAT – as a far-forward intensive care and diagnostic support platform. Evaluated methods to treat tension pneumothoraces. Investigated microencapsulated antioxidants and their effects on wound healing in animal models. • 2383 - Supplemented Life Support for Trauma and Transport (LSTAT) platform. • 2891 - Completed study demonstrating antimicrobial efficacy of coated stainless steel external fixator pins in an animal model of bone fracture. Received Food and Drug Administration (FDA) approval and concluded study on 5% aqueous sulfamylon soaks used in topical treatment of burns. Supported Joint Medical Operations-Telemedicine Advanced Concept Technology Demonstration. Paid general and administrative expenses for the Institute of Surgical Research. <p>Total 10440</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1168 - Evaluate the enhancement of clot expression and integrity with procoagulant and antifibrinolytic agents during hypothermia. Examine the potential for transfusion-related multiple organ failure after transfusion of extended storage-life red blood cells. Evaluate the potential use of FDA-approved drugs to decrease blood loss after severe liver injury. Assess the importance of hypothermia as an inducer of coagulopathy during hemorrhage. Continue to develop liquid red blood cell storage system to achieve 12-week storage. Begin evaluation of techniques for the formulation and assessment of efficacy and safety of dried plasma products. 									
Project A874		Page 20 of 40 Pages				Exhibit R-2A (PE 0602787A)			

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602787A Medical Technology	PROJECT A874
<p>FY2000 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 1223 - Evaluate hypotensive resuscitation after hemorrhage as an optimal resuscitation strategy on the battlefield. Determine arterial pressure at which rebleeding occurs during resuscitation in an aortotomy model to identify an important resuscitation parameter. Evaluate hypertonic fluid therapy for resuscitation after combined brain trauma and hemorrhage. Investigate methods to protect endothelial cell integrity after ischemia/reperfusion injury. Investigate the use of cytofluorometric measures to select combined therapies to inhibit inflammation after hemorrhage and resuscitation. Test efficacy of lisofylline to protect hepatic function and plasma volume following severe trauma and delayed resuscitation. • 1355 - Examine antioxidative neuroprotective efficacy of polynitroxyl hetastarch and the oxygen-carrying red blood cell substitute polynitroxyl hemoglobin. Test n-acetylaspartylglutamate and n-acetylated linked acidic dipeptidase inhibitors to protect against ischemia/reperfusion injury. Investigate poly (ADP-ribose) polymerase as a target for neuroprotective therapies following traumatic brain injury. Undertake a pharmacodynamic study of lisofylline in burn patients with inhalation injury. Investigate defective immune responses following exposure to heat. Establish models to examine protection from smoke inhalation injury in human bronchial/tracheal and small airway epithelial cells. Identify and quantitate inflammatory mediator mRNA alterations after hemorrhage by cDNA microarray assay. Develop inhibitors of constitutive nitric oxide synthase to prevent injury caused by ischemia. • 4638 - Develop methods for sterilization of dental equipment at far-forward locations. Continue development of mini-STAT to provide casualty monitoring and support in far-forward localities. Pay general and administrative expenses for the Institute of Surgical Research. Support Joint Medical Operations-Telemedicine Advanced Concept Technology Demonstration. • 153 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 8537</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 1900 - Test miniature version of the CSTAT – the miniSTAT – as a far-forward intensive care and diagnostic support platform. Continue development of a noninvasive physiologic monitoring system for use by medics on the battlefield. Continue development of in vivo models and testing of therapies for ischemia/reperfusion injury in brain, spinal cord, and other organs. Complete preclinical evaluation of anticaries and antiplaque peptides. Complete evaluations of topical anti-infective agents. • 1965 - Continue to evaluate treatments for smoke and thermal inhalation injuries. Continue research into the treatment of burns. Conduct evaluations of wound and injury repair techniques to correct battle or training injuries. Investigate the diagnosis and treatment of blunt trauma injuries. Continue development of medical surgical devices to simplify treatment of trauma in austere environments. • 1841 - Continue evaluation of techniques for the formulation and assessment of efficacy and safety of dried plasma products that will replace frozen product. Evaluate non-fibrin-based hemostatic dressings. Continue testing of fibrin foam-based hemostatic agent. Complete testing of storage solution for 10-week storage of red blood cells. • 3100 - Pay general and administrative expenses for the Institute of Surgical Research. <p>Total 8806</p>		
Project A874	Page 21 of 40 Pages	Exhibit R-2A (PE 0602787A)

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A878	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A878 Health Hazards of Military Materiel	8329	9267	10642	11369	11718	12182	12700	Continuing	Continuing
<p>Mission Description and Justification: This project focuses on protecting soldiers from health hazards associated with their own materiel and operational environments. Emphasis is on identification of health hazards inherent to the engineering design and operational use of equipment, systems and materiel used in Army combat operations and training. Specific hazards include repeated impact/jolt and vibration stress from the operation of combat vehicles and aircraft; blast overpressure and impulse noise generated by firing weapons systems; toxic chemical hazards associated with deployment into environments contaminated with industrial waste and agricultural chemicals; non-ionizing radiation directed energy sources (laser); and environmental stressors (e.g., heat, cold, terrestrial altitude). Specific research tasks include characterizing the extent of exposure to potential hazards; delineating exposure thresholds for illness or injury; identifying exposure thresholds for performance degradation; establishing biomedical databases to support protection criteria; and developing and validating models for hazard assessment, injury prediction, and health and performance protection.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 2518 - Identified a safe range of helmet weights and centers of mass that can be tolerated by female helicopter pilots without affecting health or performance. Discovered that helmet mass design criteria for female and male helicopter aviators are the same based on head motion but may be different based on performance indicators. • 1111 - Confirmed the validity of the U.S. Army Fluid Replacement Guidelines for hot weather training to ensure prevention of dehydration without causing overhydration problems. • 1376 - Refined predictive model of toxic combustion gas incapacitation with incorporation of results from halon fire suppressant alternatives and injury biomarker studies. • 1488 - Developed and beta tested an initial version of the Laser Accident and Incident Registry. Developed data query system for analysis of laser accidents and incidents. • 1836 - Completed first phase of a low-cost method for identifying coliform bacterial growth on membrane filters that reduces time to identification by about 75% (2-4 hours). <p>Total 8329</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2498 - Study injury mechanisms for exposure conditions inherent to military lasers operating in the visible and near infrared region of the spectrum to refine operational exposure limits. • 1473 - Validate the application of the Frog Embryo Assay, Xenopus (FETAX) assay as a screening tool to evaluate militarily relevant chemicals: TNT, RDX, HMX, their breakdown products, and select mixtures, for their ability to cause birth defects. • 3242 - Incorporate data on pathophysiology of combined fire gas exposure into combined gas injury incapacitation predictive models using scaling rules developed to extrapolate data from small and large animals to humans. 									
Project A878		Page 22 of 40 Pages				Exhibit R-2A (PE 0602787A)			

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602787A Medical Technology	PROJECT A878
<p>FY 2000 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 815 - Complete validation of cold water immersion safety limits for Ranger training using data from temperature pills collected in free-ranging Ranger students. • 1044 - Develop standardized baseline UH-60 simulator, flight performance database for application within spatial disorientation and sustained operations studies. • 195 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 9267</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 2997 - Develop treatment guidance for a field therapy kit for laser-induced retinal injury. • 3089 - Validate predictive finite element models of blunt trauma, incorporating impact measurement, response model, and injury correlates. • 1026 - Develop predictive models of head-supported mass and neck injury for aviation applications using manikins and validate performance-based modeling with in-flight testing. • 2265 - Evaluate the effects of physical fatigue, sleep deprivation, and other operational stressors on the pathophysiological responses to acute or chronic cold exposures. • 1265 - Assess the impact of fatigue countermeasures and training on prevention of spatial disorientation accidents. <p>Total 10642</p>		
Project A878	Page 23 of 40 Pages	Exhibit R-2A (PE 0602787A)

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A879	
COST (<i>In Thousands</i>)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A879 Medical Factors Enhancing Soldier Effectiveness	7759	8019	8438	8725	9015	10214	10739	Continuing	Continuing
<p><u>Mission Description and Justification:</u> This project focuses on sustaining warfighting capability by preventing health and performance degradation in the military environment. Emphasis is on identification of baseline physiological performance and assessment of degradations produced by operational stressors. This database and collection of rules and algorithms for performance degradation in multistressor environments form the basis for the development of behavioral, training, pharmacological and nutritional ("skin-in") interventions to prevent decrements and sustain soldier performance. Key stressors include psychological stress from isolation, new operational roles, and frequent deployments; inadequate restorative sleep; prolonged physical effort and inadequate hydration in extreme environments; desynchronization of biological rhythms during deployments across multiple time zones and night operations; and thermal and altitude stress.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 1294 - Demonstrated that low aerobic fitness was a significant risk factor for serious injury in both men and women upon entry into basic combat training. • 1246 - Developed initial computer models for the assessment of the effects of grayscale levels and letter legibility on performance. Developed an image-capture system and software analysis program to determine image characteristics with respect to spatial frequency and contrast levels. Completed initial tests to determine optimal time over target of laser projection system for head-mounted display. • 833 - Determined that the thermoregulatory system "fatigues" as indicated by blunting of metabolic heat production when multiple cold exposures are repeated within a day. • 2650 - Discovered problem side effect with Modafinil in aviators with multiple high doses. • 1736 - Developed and refined integration of SCENARIO model into MERCURY for reliable prediction of physiological responses to heat and cold stress application in training and operations for both mounted and dismounted soldiers. <p>Total 7759</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1346 - Quantify effects of current and developmental load-carrying gear, clothing, and individual equipment configured for specific squad positions on the biomechanics and physical performance of warfighters. • 1824 - Study the effects of high OPTEMPO/PERSTEMPO on soldier and unit readiness for a wide range of military outcomes including marksmanship, soldier retention, and soldier physical and psychological health. • 2616 - Validate models for predicting the water and metabolic requirements of warfighters operating in mountain environments. • 967 - Develop interim Health Hazards Assessment method and standard for repeated jolt. • 1139 - Transition caffeine research, including data on formulations, optimal dosing, and effects in habituated and nonhabituated users, to a caffeine product and/or guidance for caffeine use in the field. • 127 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 8019</p>									
<div style="display: flex; justify-content: space-between;"> Project A879 Page 24 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602787A Medical Technology	
PROJECT A879		
<p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 1297 - Demonstrate efficacy of local vasodilators to maximize regional dry heat loss in combination with current microclimate cooling techniques. • 1580 - Simulate cardiovascular parameters and body fluid shifts to better predict initial stages of heat injury and to model effects of dehydration. • 1618 - Demonstrate modafinil efficacy for militarily relevant performance sustainment in flight and in field environments. • 1354 - Identify application of objective physiological test such as voice stress analysis and pupillometry to assess military performance including study of a company-size unit during a real-world mission employing biostatus monitors. • 2589 - Determine how characteristics of carried loads affect the biomechanical and performance parameters and extend the gait model to accommodate varying terrain conditions. <p>Total 8438</p>		
<div style="display: flex; justify-content: space-between; margin-top: 400px;"> Project A879 Page 25 of 40 Pages Exhibit R-2A (PE 0602787A) </div>		

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A921	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A921 Ovarian Cancer Research	0	11771	0	0	0	0	0	0	11771
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this appropriation is only for ovarian cancer research.</p> <p>FY 1999 Accomplishments: Funded within the Defense Health Program in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 11454 - Determine FY 2000 vision in a meeting in February 2000. Receive and evaluate proposals. • 317 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 11771</p> <p>FY 2001 Planned Program: Project not funded in FY 2001. Award proposals from the FY 2000 program.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A921 Page 26 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A948	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A948 Portable Cardiopulmonary Bypass Pump and Oxygenator	1925	0	0	0	0	0	0	0	1925
<p><u>Mission Description and Justification:</u> By Congressional direction, conduct research to advance cardiopulmonary bypass pump and oxygenator technology.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 1925 - Completed review of proposals and conducted peer reviews. - Developed a re-usable but ultimately disposable driver for the pump of the cardiopulmonary bypass fund system. <p>Total 1925</p> <p>FY 2000 Planned Program: Project not funded in FY 2000. Award contract for FY 1999 research grant.</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A948 Page 27 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A949	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A949 Advanced Cancer Detection	3374	0	0	0	0	0	0	0	3374
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this appropriation is only for Advanced Cancer Detection.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 3374 - Received 2-year funds in January 1999. Published a program announcement in March 1999. - Completed scientific peer review and programmatic review in July 1999. Funded one proposal in full and working with the University of South Florida on a scientifically meritorious proposal for the balance of the appropriation. <p>Total 3374</p> <p>FY 2000 Planned Program: Project funded under program element 0603002, project 818 in FY 2000.</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A949 Page 28 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A950	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A950 Teleradiology	2890	0	0	0	0	0	0	0	2890
<p><u>Mission Description and Justification:</u> By Congressional direction, this program funds continuation of efforts to develop experimental technologies that will allow medical imaging to be deployed in remote and far-forward locations. Additionally, this program will fund the research for the development of imaging networks that can deliver medical studies for interpretation.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 2890 - Grant awarded and cooperative research and development efforts conducted between the Uniformed Services University of the Health Sciences and the University of South Florida. <p>Total 2890</p> <p>FY 2000 Planned Program: Project not funded in FY 2000.</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A950 Page 29 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A951	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A951 Diagnostic and Surgical Breast Imaging	1926	0	0	0	0	0	0	0	1926
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this appropriation is only for Diagnostic and Surgical Breast Imaging.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 1926 - Received 2-year funds in January 1999. Published a program announcement in March 1999. Received and peer reviewed two proposals. Neither proposal was recommended for funding at programmatic review. The Commanding General of the United States Army Medical Research and Materiel Command, directed re-competition. - Re-advertised the project on August 26, 1999 and received 23 proposals by October 1999. <p>Total 1926</p> <p>FY 2000 Planned Program: Project not funded in FY 2000. Conduct scientific peer review and programmatic review by early March 2000 and make initial awards by May 2000 for FY 1999 awards.</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A951 Page 30 of 40 Pages Exhibit R-2 (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A952	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A952 Musculoskeletal Injuries	1926	5885	0	0	0	0	0	0	7811
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this project is to develop initial research models for musculoskeletal injuries.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 1926 - Evaluated competitive contracts/grants to initiate research on musculoskeletal injuries. Awarded research grants. <p>Total 1926</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 5727 - A solicitation for research proposals will be developed and competed. • 158 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 5885</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A952 Page 31 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A953	
COST <i>(In Thousands)</i>	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A953 Disaster Relief and Emergency Medical Services	9630	9809	0	0	0	0	0	0	19439
<p><u>Mission Description and Justification:</u> By Congressional direction, this program funds efforts to improve the delivery of emergency medical services through basic physiologic research and advances in the application of information and advanced medical technologies.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 9630 - Continued development of disaster relief and emergency and biological medical response capability at the University of Texas – Houston and Texas A&M. <p>Total 9630</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 9545 - Continue development of disaster relief and emergency and biological medical response capability at the University of Texas – Houston and Texas A&M. • 264 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 9809</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A953 Page 32 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A962	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A962 Polynitroxylated Hemoglobin	0	1962	0	0	0	0	0	0	1962
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this program is to establish a process to select medical research projects of clear scientific merit and direct relevance to military health including polynitroxylated hemoglobin.</p> <p>FY 1999 Accomplishments: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1909 - Awaiting proposal submission for evaluation to be followed by contract award. • 53 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 1962</p> <p>FY 2001 Planned Program: Project not funded in FY 2000.</p>									

Project A962
Page 33 of 40 Pages
Exhibit R-2A (PE 0602787A)

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A963	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A963 National Medical Testbed	0	14714	0	0	0	0	0	0	14714
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this program is to conduct wide-ranging research that will explore, demonstrate, and evaluate technologies and systems that facilitate delivery of health care to distributed, underserved populations, including deployed active duty service members and the general civilian population.</p> <p>FY 1999 Accomplishments: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 14318 - Award cooperative (research) agreement to the Loma Linda University Medical Center to conduct exploratory research and development of various advanced medical (and supporting nonmedical) technologies, and clinical and epidemiological studies that support optimal provision of surgical, trauma, and emergency health care in a (military/civilian) community setting. • 396 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 14714</p> <p>FY 2001 Planned Program: Project not funded in FY 2000.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A963 Page 34 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A964	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A964 Infomatics-based Medical Emergency Tools	0	4414	0	0	0	0	0	0	4414
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this program is to conduct research that will explore, demonstrate, and evaluate various (medical and nonmedical) informatics tools and systems that will enhance emergency medical diagnosis, treatment, and patient regulation when time is a critical variable that will determine mortality and morbidity.</p> <p>FY 1999 Accomplishments: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 4295 - Award cooperative research agreement to conduct exploratory development and demonstration of clinical decision support module, device, and architecture that will enhance diagnosis, treatment, and patient management (e.g., traumatic and chemical/biological mass casualties. • 119 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 4414</p> <p>FY 2001 Planned Program: Project not funded in FY 2000.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A964 Page 35 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A965	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A965 Eye Research	0	1962	0	0	0	0	0	0	1962
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this program is to support collaborative efforts in exploratory low vision eye research.</p> <p>FY 1999 Accomplishments: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1909 - Award cooperative research agreement to conduct exploratory research and development and demonstrate devices (e.g., instrumentation research) and techniques that prevent, facilitate treatment of, and minimize the effects (on human behavior) of low vision. • 53 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 1962</p> <p>FY 2001 Planned Program: Project not funded in FY 2000.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A965 Page 36 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A966	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A966 Blood Research	0	5395	0	0	0	0	0	0	5395
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this program is for research into improved blood products and safety in systems compatible with military field use.</p> <p>FY 1999 Accomplishments: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 5250 - Awaiting proposal submission for evaluation to be followed by contract award. • 145 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 5395</p> <p>FY 2001 Planned Program: Project not funded in FY 2000.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A966 Page 37 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A967	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A967 Dye Targeted Laser Fusion	0	2943	0	0	0	0	0	0	2943
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this program is for research into tissue repair systems.</p> <p>FY 1999 Accomplishments: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2864 - Awaiting proposal submission for evaluation to be followed by contract award. • 79 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 2943</p> <p>FY 2001 Planned Program: Project not funded in FY 2000.</p>									

Project A967
Page 38 of 40 Pages
Exhibit R-2A (PE 0602787A)

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A968	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A968 Synchrotron-based High Energy Radiation Beam	0	4905	0	0	0	0	0	0	4905
<p><u>Mission Description and Justification:</u> By Congressional direction, the purpose of this program is to conduct research that will explore, demonstrate, and evaluate the application of proton beam radiation therapy (supported by three-dimensional imaging and planning applications) to the treatment of various types of cancer.</p> <p>FY 1999 Accomplishments: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 4773 - Award cooperative research agreement to Loma Linda University Medical Center to conduct exploratory development, integration, and demonstration of an accelerator and switchyard that will enable precise, extended delivery of proton beam radiation therapy in a treatment room/facility. Funds are currently awaiting release by OSD for FY 2000. • 132 - Small Business Innovative Research/Small Business Technology Transfer Research Programs. <p>Total 4905</p> <p>FY 2001 Planned Program: Project not funded in FY 2000.</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A968 Page 39 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602787A Medical Technology				PROJECT A977	
COST (In Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A977 Emerging Infectious Diseases	0	0	6957	0	0	0	0	0	6957
<p><u>Mission Description and Justification:</u> The scientific and technical objectives for this project focus on accelerating development of infectious disease threat countermeasures necessary to support operations in nonindustrialized countries and those in which infrastructure has been damaged or destroyed. It will also fund the necessary research to counter the military operational impact of emerging infectious diseases.</p> <p>FY 1999 Planned Program: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program: Project not funded in FY 2000.</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 6957 - Complete applied research to characterize possible tools and components of protective measures against emerging infectious diseases. <p>Total 6957</p>									
<div style="display: flex; justify-content: space-between; padding: 10px;"> Project A977 Page 40 of 40 Pages Exhibit R-2A (PE 0602787A) </div>									